QUIGLEY COMPANY INC.

Manufacturers of Industrial Specialties

General Offices - 56 West 45th Street - New York

REFRACTORY DIVISION

CATALOG H. G. 501

HYTEMPITE

(REG. U. S. PAT. OFF.)

PLASTIC AIR-SETTING, HIGH TEMPERATURE CEMENT

for

BONDING REFRACTORY BRICK and SHAPES

FAMOUS FOR ITS ECONOMY OF APPLICATION,
STRONG BOND, UNIFORMITY,
DEPENDABILITY

Used for

QUICK HOT-OR-COLD FURNACE REPAIRS
BUILDING MONOLITHIC GAS/TITE BAFFLES,
LINING LADLES, REPAIRING OVENS, ETC.

Used in

STEAM POWER PLANTS
IRON AND STEEL WORKS
NON-FERROUS FOUNDRIES
SMELTERS AND REFINERIES
GAS WORKS, BY-PRODUCT COKE PLANTS
RETORT OVENS, OIL REFINERIES
DOMESTIC OIL BURNERS
CERAMIC PLANTS, GLASS WORKS
SUGAR CENTRALS, INCINERATORS, ETC.

HYTEMPITE

"The World's Standard High Temperature Cement"

ECONOMY • DEPENDABILITY

Fig. 1. Two of Our Clay Pits. Note How the Clay is Hand Inspected and Sorted.

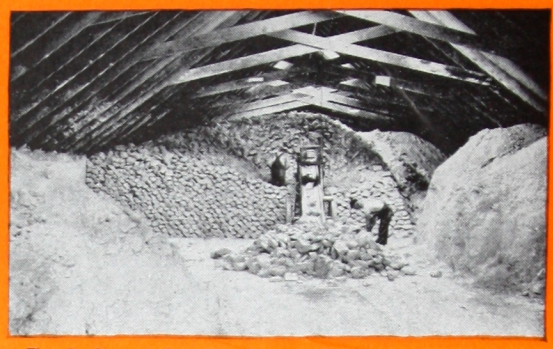


Fig. 2. One of Our Clay Storage Buildings. Only Selected Clays are Used.

FROM PIT TO PLATFORM

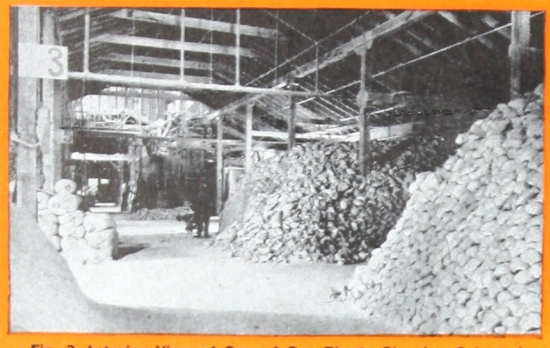


Fig. 3. Interior View of One of Our Plants Showing Selected Clays Ready for Use.

Fig. 4. A View of Our Chemical Laboratory. Nothing Escapes the Scrutiny of Our Experts.

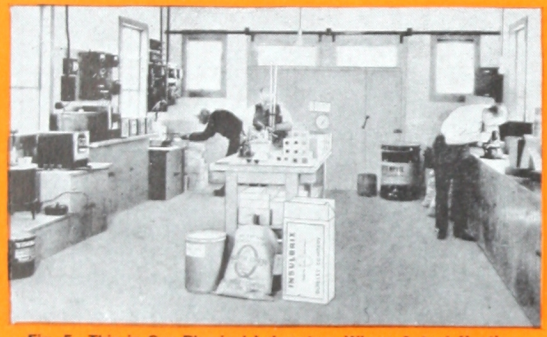


Fig. 5. This is Our Physical Laboratory Where Actual Heating is Done in Small Furnaces in Conjunction With Larger Furnaces.

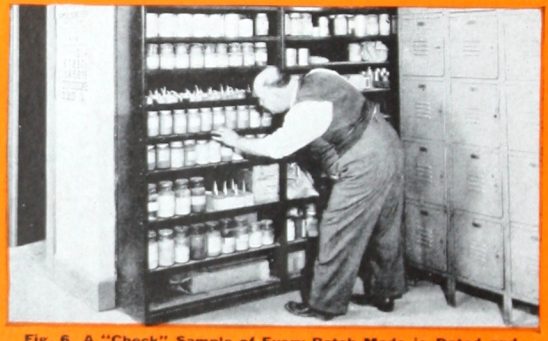


Fig. 6. A "Check" Sample of Every Batch Made is Dated and Retained. Drums Shipped From Each Batch are Also Dated. Another Check on HYTEMPITE Quality.

Fig. 7. Truck Loaded With HYTEMPITE at Factory for Near-by Delivery.

Fig. 8. Carload and Less-Carload Shipments of HYTEMPITE Being Made From Our Factory After a Thorough Check of the Product "From Pit to Platform."

QUALITY • DURABILITY

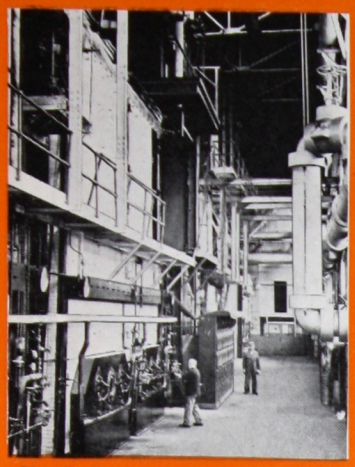


Fig. 9. Carpet Factory – HYTEMPITE Used Exclusively for 15 Years to Bond and Repair Fire Brick.

Fig. 10. Constructing Bridge Wall on 1200 h.p. Badenhausen Boiler With Quigley Fire Erick and HYTEMPITE.

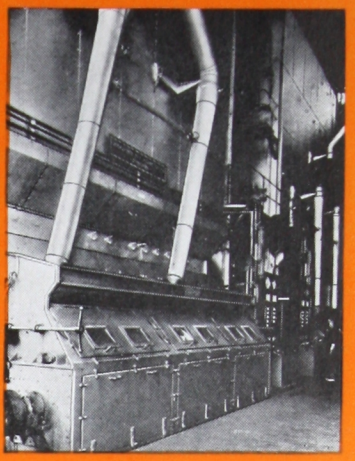


Fig. 11. Two Largest Boilers in Europe. Fire Brick Bonded With HYTEMPITE.

HYTEMPITE

(REG. U.S. PAT. OFF.)

Cuts Construction and Maintenance Cost

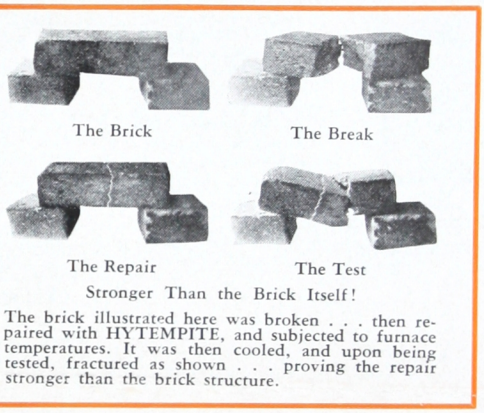
Wherever Fire Brick is Used

HYTEMPITE is a scientifically compounded, plastic, air-setting high temperature cement, for bonding fire brick and silica brick, etc. with thin, strong, air-and-gas-tight joints; for making air-setting plastic refractory mixtures used in building monolithic GAS/TITE baffles, and for quick hot-or-cold furnace repairs. It can be used as a binder wherever fire brick, silica brick, or granular refractories are used.

HYTEMPITE forms a lasting union between the materials joined. Retains its strength up to temperatures at which standard fire brick soften and fail, yet permits expansion and contraction of the bonded structure. Does not depend on heat for its adhesive qualities (air-sets at normal temperatures). Heat merely increases the strength of the bond and quick temperature changes do not weaken it.

HYTEMPITE has exceptional plasticity. It stays in uniform suspension and spreads easily. The smooth texture of HYTEMPITE, coupled with its strong bonding qualities, permits of thin, strong joints between brick, tile or shapes — in accordance with modern approved engineering practice.

HYTEMPITE is light in weight per unit of volume. A given quantity of HYTEMPITE (varying according to the care exercised, texture, density and uniformity of the brick) will lay more brick than the same quantity of most other cements. HYTEMPITE is made entirely from virgin materials — does not contain ground brick or other aggregate as a base.



Stronger Than the Brick Itself!

The brick illustrated here was broken . . . then repaired with HYTEMPITE, and subjected to furnace temperatures. It was then cooled, and upon being tested, fractured as shown . . . proving the repair stronger than the brick structure.

HYTEMPITE is bought by the pound — used by volume.

Experience of users has proved that from 225 to 350 pounds of HYTEMPITE (or even less) will lay 1000 standard fire brick with "dipped" or brick-to-brick joints, according to uniformity of the brick.

HYTEMPITE forms a lasting bond — *all the way through* the joint—not a surface bond—thus producing a virtually monolithic air-and-gas-tight structure. Will not disintegrate or crumble out of the joint. The mechanical strength of furnace walls and boiler settings laid with HYTEMPITE has been demonstrated under many severe service conditions.

HYTEMPITE insures a labor-saving and durable refractory construction. It has PROVED dependable and economical.

BONDING REFRACTORY BRICK AND SHAPES

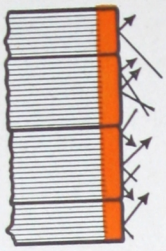


Fig. A
A smooth, tight wall bonded with HYTEMPITE reflects heat, as indicated by arrows, resulting in full benefit of the heat within the furnace chamber. Red indicates heat penetration.

Fig. B
Wall laid with fire clay. Note how the bond has deteriorated under the action of heat and how deeply heat penetrates the wall, as indicated by red portion.

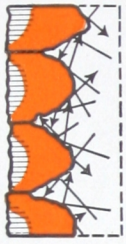


Fig. C
Brick are exposed to the cutting action of flames and gases on several sides—corners are rounded and ends eaten away, with resulting erosion and disintegration. The wall becomes thinner and heat penetrates further with increased heat losses.

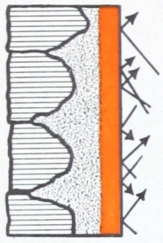


Fig. D
Wall restored to good condition with a mixture of HYTEMPITE and crushed old fire brick. Heat penetration is again at a minimum, as in Fig. A. Maximum efficiency is obtained.

Colored Zones Indicate Heat Penetration

HYTEMPITE is used for bonding fire clay brick and tile with thin, strong, air-and-gas-tight joints.

For this purpose, take HYTEMPITE as it comes in the drum, and put it into a mortar box. Add water slowly and reduce to a heavy "pancake" batter consistency. This is HYTEMPITE "batter"—and is the mixture to be used for laying fire brick. Fresh water (never salt water) should always be used for diluting HYTEMPITE. Dip brick in the batter, squeeze or tamp in place to insure a close fit.

After laying up new brickwork treat the surface first with a thin white-wash coat of HYTEMPITE, followed by a coat of the same batter mixture as used for laying the brick. This fills the pores and fractured edges of brick; and will give a practically one-piece structure—gas-and-air-tight. HYTEMPITE will not loosen and crumble out of the joints with sudden changes of temperature.

A drying fire may be started immediately after the brickwork has been completed without affecting the bond.

When HYTEMPITE is used for bonding the brickwork, a structure is produced in which the joints are as strong and resistant as the brick itself, thus definitely prolonging the life of furnace linings.

PATCHING BOILER SETTINGS AND FURNACE LININGS

In many cases a major repair to a boiler setting or furnace lining is avoided by patching eroded areas.

HYTEMPITE serves with great satisfaction and economy for a wide range of furnace repair jobs. It is adapted to pointing up cracks, filling small holes, and patching burned out or fallen sections of furnace walls and arches.

HYTEMPITE is adapted for *hot or cold patching*—repairs can often be made without a shutdown—while the furnace is hot.

Minor cracks are pointed up with neat (undiluted) HYTEMPITE.

HYTEMPITE requires no heat to effect a bond, so that the newly applied patch can be built up in the hole or crevice, and become an integral part of the structure.

When a monolithic patch or replacement is desired—such as a large wall patch to replace eroded brickwork—best practice is to remove any glaze or clinker from the area to be patched, then apply a thin wash-coat of diluted HYTEMPITE, after which follow with a bonding coat of neat (undiluted) HYTEMPITE, and then plug the area with MONO-LINE (Plastic Fire Brick), ramming or pounding same into place.

Fig. 12. Municipal Incinerator – Flue Chamber Roof and Back Wall Laid With HYTEMPITE.

Fig. 13. Saw Mill Waste Fuel Burner 65-ft. High. Fire Brick HYTEMPITE Laid.

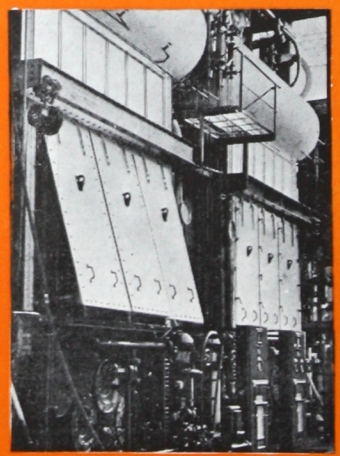


Fig. 14. Rubber Factory – HYTEMPITE Used to Bond and Repair Brickwork in Combustion Chambers.

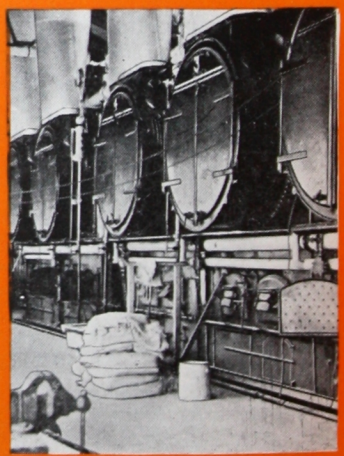


Fig. 15. Pineapple Plantation Power Plant – Five 72" x 18' HRT Oil Fired Boilers. All Brickwork Bonded With HYTEMPITE.

Or in many cases, where old crushed fire brick is available, eroded areas may be patched with a mixture of HYTEMPITE and suitable refractory aggregate. Such patches may be rammed in behind a wood form or applied with the QUIGLEY REFRACTORY GUN (described on page 19). Unless wall surface affords good anchorage, patches greater than 2½-in. thickness should not be applied either by hand or GUN without bringing furnace up to full operating temperatures.

Tables of approximate mixtures given below will serve as a guide in the various uses of HYTEMPITE. Full directions accompany each container.

TABLES FOR MIXING

HYTEMPITE comes prepared and is ready for use by adding a little water, though sometimes used "neat" for hot patching of small breaks, etc. It is uniform in grade and analysis. Instructions for use accompany each drum or container and when these instructions are followed the results are always most satisfactory. These directions are based on the experience of practical fire brick masons and operating engineers who have used HYTEMPITE exclusively for many years.

Mix	APPLICATION	APPROXIMATE QUANTITIES	
1	**Laying Fire Brick** **Laying Tile** **Laying Blocks**	Use HYTEMPITE Batter. 225 to 350 lbs. of HYTEMPITE will lay 1000 brick. (a)	
2	**Surface Wash (b)** For brick work patches and rammed-in linings.	Dilute HYTEMPITE to thin milky solution. Apply with a brush.	
3	**Ramming in** Furnace Linings Monolithic Walls Furnace Walls Repairs Special Shapes, Baffle Tile	POUNDS (Approximate)	
		HYTEMPITE	Granular Refractory Crushed Old Fire Brick, Ganisand, etc.
		100	175
4	**Boiler Baffles (Monolithic)**	100	100 (c)
5	**Hot Patches, Troweled Patches** **Veneer Coating, Coke Oven Jambs**	100	100 (d)
6	**Quigley Refractory Gun** (See page 19)		

a. Depending on care used, and the uniformity and texture of the brick.

b. **Q-CHROMASTIC, the QUIGLEY chrome base veneer is often preferred for a surface coating to resist severe firing and slagging conditions. If Q-CHROMASTIC is to be used do not apply surface wash of HYTEMPITE. Directions for using Q-CHROMASTIC supplied on request.**

c. Monolithic boiler baffles use ¼" mesh aggregate with fines included.

d. For Veneer or Skin Coating and Coke Oven Jamb Joints use a fine mesh aggregate, not over 1/16"

The amount of water to be used when diluting HYTEMPITE will vary somewhat, depending on climatic conditions, dryness of refractories, etc.
In the above table for mixtures judgment must be used, as the quantities given are approximate.
HYTEMPITE is recognized the world over as the standard material of its kind. Industrial plants totalling millions of horsepower—in this country and abroad—continue, as in years past, to use HYTEMPITE for boiler and furnace construction and maintenance.
For all these reasons, users of HYTEMPITE are assured low refractory construction and maintenance costs. Shipped, NET WEIGHT, in plastic form, in air-tight, full-opening steel drums of 800, 500, 200 and 100 lbs., and in 50 and 25 lb. containers.

Fig. 16. Entire Side Wall Patched With Granular Refractory Material Bonded With HYTEMPITE. Patch Still in Perfect Condition After Over 8 Months Continuous Operation.

Fig. 17. Mixing Refractory Material With HYTEMPITE. Squeezed in the Hand it Should Just Hold Together and Not Show Free Moisture.

Fig. 18. Placing Diagonal Slats Between Tubes to Build Form for Refractory Concrete Baffles.

Fig. 19. All Slats are in Place and are Nailed to Stringers at Each End.

Fig. 20. Baffle Form Completed and Ready for Pouring Material.

Fig. 21. Pouring and Ramming Refractory Concrete Baffle Using HYTEMPITE to Bond Mixture.

QUIGLEY GAS/TITE BAFFLES

REG. U. S. PAT. OFF.

INCLINED OR VERTICAL BAFFLES MADE OF CRUSHED FIRE BRICK BONDED WITH HYTEMPITE

Engineers everywhere recognize the importance of tight boiler baffles which will stand up under forced firing and extreme temperature variations without developing cracks and leaks. Quigley "GAS/TITE" Baffles, vertical or inclined, using HYTEMPITE to bond the refractory material, have been installed in power plants representing millions of boiler horsepower. Thousands of other plants have used HYTEMPITE to repair existing baffles, to increase steaming capacity and save fuel.

BUILDING THE BAFFLES

Old fire brick linings crushed to pass ¼" mesh, including fines, are mixed with diluted HYTEMPITE. The plastic mixture is tamped in place against a wood form as shown in the illustrations. If old linings are not available, Quigley GANISAND or commercial crushed fire brick may be used. GANISAND is a highly refractory ganister correctly proportioned as to fine and coarse particles for baffles or other work requiring an aggregate.

QUANTITIES

The approximate mixture to use for the tamped method of construction is in proportion:

HYTEMPITE, 100 lbs. Crushed Fire Brick or GANISAND, 100 lbs.

To calculate the total weight of both materials required for a 4" baffle, multiply the number of tubes which pass through the baffle as follows:

For Straight Baffle—Number of tubes x 14 pounds
For Inclined Baffle—Number of tubes x 16 pounds

MIXING

Dilute HYTEMPITE with water in a mortar box to the consistency of a smooth pancake batter. Then gradually add the crushed fire brick or GANISAND, mixing thoroughly. The mixed materials should be firm enough so that it can be formed into balls or cakes and cling together. If a large quantity is mixed, at one time, it should be covered with wet bags or burlap to retain the moisture, especially if it stands overnight.

It is best to make the mixture the day before it is to be used, if possible, to permit thorough tempering.

HOW TO BUILD THE FORM

The dimensions here given are based on 4" tubes having 7" centers. Other tube diameters and spacing require suitable variations.

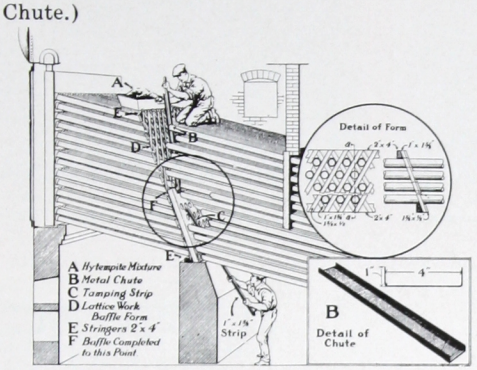
1.—Lay 2" x 4" Stringers (E-E) across the tubes to support

the lattice. Bevel one side of stringers if necessary.

2.—Place 1″ x 1⅝″ slats down diagonally between tubes and nail or wire them to stringers. Then place thinner slats (½″ x 1⅝″) diagonally in opposite direction as shown in "Detail of Form" (in circle). Nail or wire these securely at top and bottom.

PLACING THE PLASTIC MIXTURE

The material chute (B) is made from a piece of black or galvanized sheet iron (about 18 to 24 gauge) 6″ wide, by bending up the sides one inch, so as to fit between the tubes. These sides are slotted at intervals to make the chute flexible. (See Details of Chute.)



Method of Building "GAS/TITE" Baffles Using HYTEMPITE to Bond Refractory.

The plastic material (A) is brought from the mortar box into the boiler in suitable quantities.

1. — Place the chute (B) down between the tubes starting work at one of the lower corners.

2.—Use a handful of the plastic mixture at a time and slide it down the chute, using a thin wood strip to push from above. A man stationed beneath the tubes tamps the material as it is placed, using a 1″ x 1⅝″ strip. This strip (C) has a shoulder at the end so that the material can be worked snugly around the tubes.

The width of the chute is a guide for maintaining uniform thickness of the baffle.

3.—Tamping of baffle along the upper rows of tubes is done from above.

A slow fire may be started as soon as the baffle is completed. The form will burn off as the heat is increased or when the boiler is put on the line.

Always add the refractory material to the HYTEMPITE batter. NEVER pour the batter over the refractory material. Should the mixture become too stiff, it should be reclaimed by adding diluted HYTEMPITE batter. Do not attempt to reclaim it with water. No trouble has been experienced when withdrawing tubes and inserting new ones when necessary.

BAFFLE REPAIRS

If baffles are slightly damaged by replacing bent or blistered tubes, patch the area around the new tube with the same mixture as described for new baffles, tamping the material in place with a wood strip.

Repairs to leaky baffles are readily made with HYTEMPITE mixtures—applied with a long paddle, or better still with the QUIGLEY REFRACTORY GUN. The GUN nozzle reaches up between the tubes and applies the plastic refractory mixture at points impossible to repair by hand methods. (See Fig. 55.) The QUIGLEY REFRACTORY GUN is fully described on page 19.

BURNER BLOCKS AND SPECIAL SHAPES

Many plants which are regularly using HYTEMPITE mix it with GANISAND or crushed old fire brick to form special shapes—quickly, and at low cost.

Fig. 22. This Shows a Completed GAS/TITE Baffle and the Wood Form Ready for Building the Second Baffle

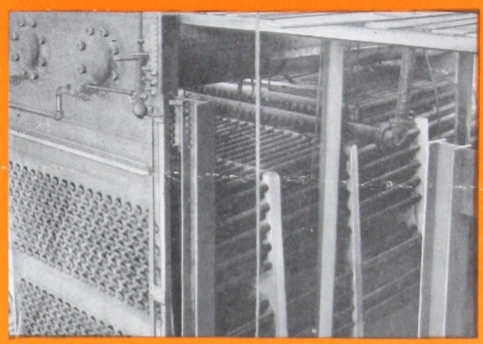


Fig. 23. One of Several QUIGLEY GAS/TITE Baffles Erected for a Public Utility. (Edge Moor Boilers)

Fig. 24. These QUIGLEY GAS/TITE Baffles Replaced Tile Baffles on an Installation of 3-3200 h. p. B. & W. Boilers.

Fig. 25. Burner Blocks and Special Shapes Made From Crushed Old Fire Brick and HYTEMPITE.

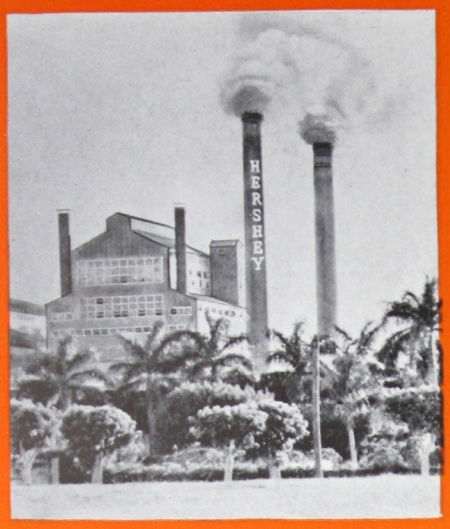


Fig. 26. Cuban Sugar Central—HYTEMPITE Used Here for Many Years to Bond Fire Brick.

Fig. 27. Central Power Station—HYTEMPITE Used Here for Years to Lay and Repair Boiler Brickwork.

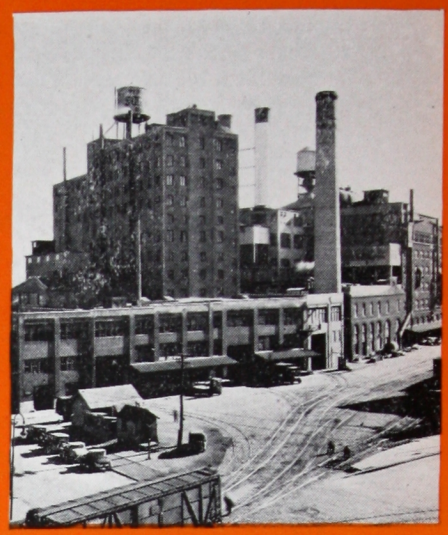


Fig. 28. Sugar Refinery — Each Boiler Develops 350,000 lbs. Steam per Hour. Boiler Brickwork Laid With HYTEMPITE.

LASTING CONSTRUCTION

HYTEM

"The World's Standard High

HOW IT SERVES SOME OF THE LEGIO

A New York bag and paper mill had trouble six years ago maintaining six large flat suspended arches in furnaces. Plant superintendent said no arch ever had stood up over 8 months and each renewal cost $1500. Observing the advantages of HYTEMPITE he took a QUIGLEY GUN and shot a stiff HYTEMPITE and GANISAND mixture into the badly spalled and eroded arches (holes 4″ deep in places) and crevices, then built up the entire structure to a uniform thickness. Since then he has kept all arches in excellent condition by veneering a ¼″ coat of HYTEMPITE and GANISAND every 5 weeks—a practice which promises to be carried on for years.

Large Eastern central power station takes old fire brick bats mixed with HYTEMPITE to build up spalled and eroded areas. The maintenance men also cast burner blocks of HYTEMPITE and crushed fire brick. For six years this station has used more than a ton of HYTEMPITE a month. They have tried other materials, but nothing comes up to HYTEMPITE in performance. An interesting fact about this particular station is that *it has the lowest maintenance* of the many power stations operated by this enormous public utility.

A giant Pennsylvania sugar refinery installed two Badenhausen pulverized coal-fired steam generating units. Furnaces 38′ high x 15′ wide x 18′6″ deep, with total heating surface per boiler of 10,000 sq. ft. Boilers operate normally at 1000% of rating at 425 lbs. pressure per sq. in., and have a maximum steaming capacity of 350,000 lbs. per hour. Water walls backed with refractory tile 3″ thick, all joints buttered with HYTEMPITE as insurance against joint leakage. Front walls of boilers (each holding 4 burners) are solid fire brick, 13½″ thick, laid and surfaced with HYTEMPITE. HYTEMPITE also used for laying the 18″ fire brick linings in ash pits. In top of each boiler is a monolithic baffle 15′ x 21′ x 4″, made with a HYTEMPITE and crushed fire brick mixture. All applications in satisfactory condition after seven years of operation.

Burning cypress saw mill waste raises havoc with fire brick in boiler furnaces and waste fuel burners. Quick temperature changes from dumping slabs and sawdust, with moisture and sap in the waste creating steam to strike hot walls, are destructive to brickwork. But HYTEMPITE thrives on tough service. That is why you find experienced engineers throughout the lumber industry using HYTEMPITE year after year.

The chief engineer of one of the world's largest cypress saw mills writes us: "I have used HYTEMPITE for over 10 years to lay fire brick and repair three 400-h.p.

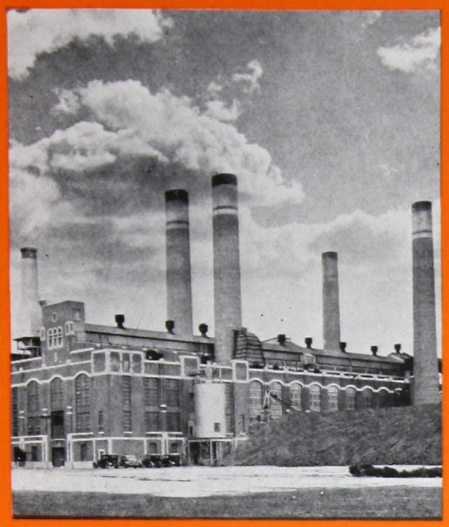


Fig. 29. Power Station—Where HYTEMPITE Has Been Used for Years to Cut Boiler Maintenance Cost.

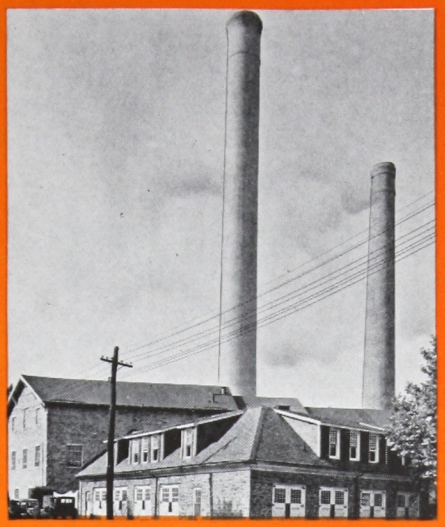


Fig. 30. Central Heating Plant—1200 h.p. Boiler Setting Laid in HYTEMPITE.

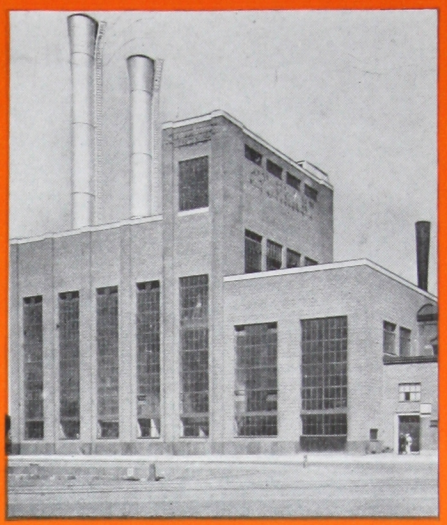


Fig. 31. European Power Station—2 Boilers, Each With Capacity 270,000 lbs. Steam per Hour, Fire Brick HYTEMPITE Bonded.

EMPITE

High Temperature Cement"

LEGION OF POWER PLANT USERS

LOW COST MAINTENANCE

boiler furnaces and our waste fuel burner. I spray HYTEMPITE with a QUIGLEY REFRACTORY GUN on inside furnace walls and on fire brick lining of our 65′ steel fuel burner. I have found HYTEMPITE very satisfactory in every place I use it."

Important Southern cypress company builds all Dutch Oven furnaces with HYTEMPITE. Extremely severe conditions are encountered here as they burn sawdust shavings and hog fuel. Boilers are 2000 h.p.

Nine years ago the boiler settings of a Tennessee woodworking plant were laid with HYTEMPITE, and have not needed repair since. Except for a slight erosion along the fire line, the walls are as tight as the day they were put in.

A Connecticut cutlery manufacturer built an incinerator in 1921, using a 50/50 mixture of HYTEMPITE and crushed fire brick for monolithic side walls, and walls and roof. In 17 years' continuous service, this incinerator HAS NOT REQUIRED A SINGLE REPAIR! The plant engineer has used HYTEMPITE—ever since it was put on the market many years ago—for the factory's boilers, annealing and other types of furnaces. The foundry uses HYTEMPITE in the lining of its ladles.

Superintendent of a well-known Virginia Portland cement mill is very well satisfied with HYTEMPITE for building monolithic decarbonator baffles.

One of the foremost New York contracting corporations, known for its excellent work in building boiler settings, baffles and incinerators, tells us: "In the last 18 months we have successfully used HYTEMPITE on more than 100 major jobs throughout the country."

Large Canadian coal company a year ago installed HYTEMPITE baffles in a 500-h.p. boiler. Success of this installation decided them to do the same in their 5 other boilers.

The continuous and exclusive use of HYTEMPITE over a long period of years for laying and maintaining fire brick in steam power plants, municipal and industrial incinerators, sugar mills and refineries, paper mills, glass works, oil refineries, ceramic, cement, lime and gypsum plants, gas works, railroad power houses, smelters, non-ferrous foundries, and a host of other industries the world over, testifies to HYTEMPITE's dependable and successful performance.

The wide acceptance of HYTEMPITE by experienced boiler setters and operating engineers is based entirely on its superior properties for economical construction and maintenance.

If you have a problem not outlined in this bulletin, or want specific information on the application of HYTEMPITE in your plant, recommendations will be sent upon request.

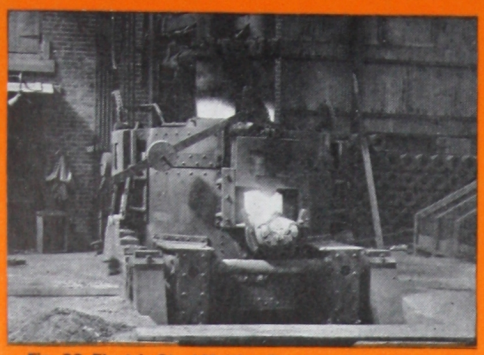


Fig. 32. Electric Steel Melting Furnace—Side Walls Laid With HYTEMPITE, Roof Grouted With HYTEMPITE Mixture.

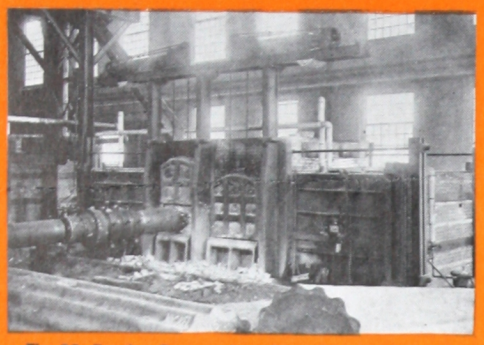


Fig. 33. Forging Furnace in a Steel Mill. Brick Laid in Q-CHROME, Surface With Q-CHROMASTIC.

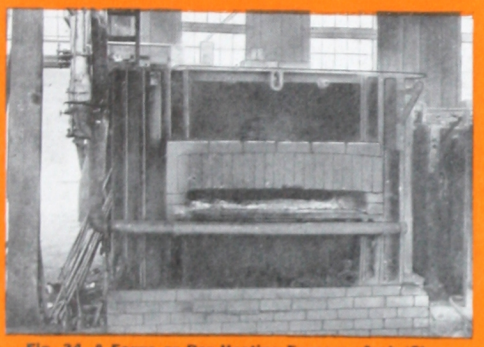


Fig. 34. A Forge or Bar-Heating Furnace—Arch (Showing in Front of Picture) and Side Walls Laid With HYTEMPITE.

Fig. 35. Heat Treating Furnaces Operating as a Unit for Case Hardening Heavy Machinery Parts.

IRON and STEEL

HYTEMPITE has been standard for years in hundreds of iron and steel plants for many uses, such as:

BLAST FURNACES

Laying up brick in wall and top; also for downcomers and hot-blast mains. Produces a structure of great durability and strength.

HOT BLAST STOVES

For bonding fire brick and silica brick in walls of furnaces and in hot blast main connections. We recommend Q-CHROME cement for combustion chamber arches and domes.

SOAKING PITS

Bonding brickwork in checker chamber and soaking pit covers. Holds the brick securely in place, reducing repairs.

STOPPER ROD TILE

HYTEMPITE, used "neat" for bonding stopped rod sleeve tile increases the strength of sleeve, and is resistant to shock and rough handling.

PATCHING AND FURNACE MAINTENANCE

For HOT or COLD patching in soaking pits, etc. and for general furnace maintenance work. In conjunction with the QUIGLEY GUN, HYTEMPITE mixtures afford the most satisfactory and economical solution of the furnace maintenance problem.

Where HYTEMPITE is used for laying fire brick linings in ladles, the faces of the brick should be buttered thin with HYTEMPITE batter or the brick may be dipped. Squeeze or tamp to insure a close fit, making thin joints. Surface over each course with diluted HYTEMPITE after brick are laid. Where fire brick linings are used in large ladles some foundrymen use a surface coat of HYTEMPITE and finely crushed fire brick which will cover all joints, leaving an absolutely smooth face.

CUPOLAS

The weakest points in a cupola lining are the joints between the blocks or brick, especially around the melting zone. The thinner these joints, the less is the opportunity for erosion or slag action.

When lining or relining the cupola, lay up block and brick with HYTEMPITE batter. This gives an air-set bond through the entire wall and prevents breaking of edges, knocking off of corners of the cupola block and will also prevent penetration of metal at joints.

HYTEMPITE is also used as a bonding coat before daubing; and as a surface wash coat after daub is done.

LADLES AND SPOUTS

For laying up brick and wash coating and repairing of linings of large ladles. Also HYTEMPITE mixed with fire clay, crushed old fire brick or GANISAND, is widely and very successfully used for lining and repairing small to medium sized ladles; also as a wash coating over same to increase life. HYTEMPITE is ideal for patching cupola and ladle pouring spouts.

CORE OVENS

HYTEMPITE is also excellent for bonding and surface coating of brickwork in combustion and heating chambers of core ovens and annealing furnaces.

CORES

HYTEMPITE, diluted with water, makes a superior core wash. Prevents penetration, and strengthens delicate cores. Saves time in cleaning of castings and makes a smoother job.

MALLEABLE FURNACES

Use HYTEMPITE for laying up brick in combustion chambers, roofs, bungs, and flues. It insures strong, durable construction, reduced maintenance and longer life. There is no shrinkage of joints after brick are laid up with HYTEMPITE —the bond extends throughout the entire thickness of wall or arch.

MALLEABLE FURNACE BUNGS

Bungs of Malleable Furnaces laid up with HYTEMPITE insure increased furnace output due to less frequent repairs. Hot gases which ordinarily cause crevices between the arch brick of the bung are slow to act on the brick when HYTEMPITE is used, as the joint is as strong as the brick. There is no shrinkage of the joint after the brick are laid —the bond extends through the entire thickness of wall or arch. HYTEMPITE is not affected by fluctuating temperatures. It produces a virtually monolithic structure that far outlasts bung linings laid up with fire clay or inferior bonding mortars.

ELECTRIC STEEL MELTING FURNACES

HYTEMPITE is used for bonding electrode rings, door jambs, and for bonding and grouting the roofs. Also for general repairs.

FORGING FURNACES

HYTEMPITE, used for laying up brickwork in roofs, side walls, door arches and jambs and flues, produces a strong virtually monolithic structure of the entire lining—resistant to vibration and shock. Reduces spalling due to fluctuations in temperature—as it prevents entrance of hot gases or cold air between the brick. HYTEMPITE is also the ideal material for pointing up cracks and holes.

HEAT TREATING AND ANNEALING FURNACES

Thousands of tons of HYTEMPITE have been used for laying up brickwork, protective surfacing, and repairing gas and oil-fired heat treating and annealing furnaces. It is standard for this work with a number of the largest plants in the industry.

ANNEALING FURNACES

Temperatures in annealing furnaces are normally so low as to make the use of fire clay decidedly ineffective. (Insufficient heat to sinter the clay). HYTEMPITE is recommended for laying up brick in walls and also HYTEMPITE mixtures for monolithic roof bungs. HYTEMPITE provides an all-temperature bond.

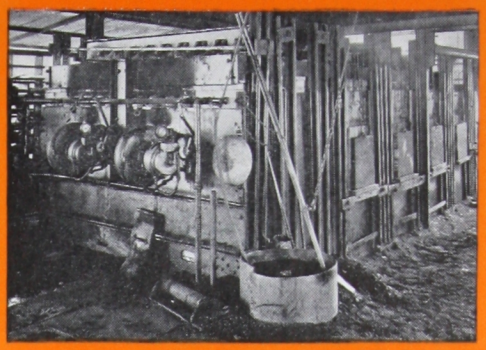


Fig. 36. Heating Furnace in Steel Rolling Mill. Quigley UNITEX Brick Bonded With HYTEMPITE. Quigley UNITEX Tile Laid Dry.

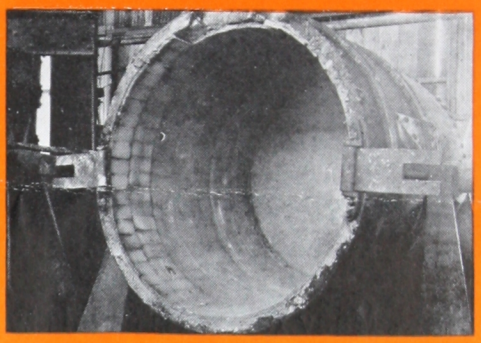


Fig. 37. Bottom Pour Ladle. Brick Laid With HYTEMPITE.

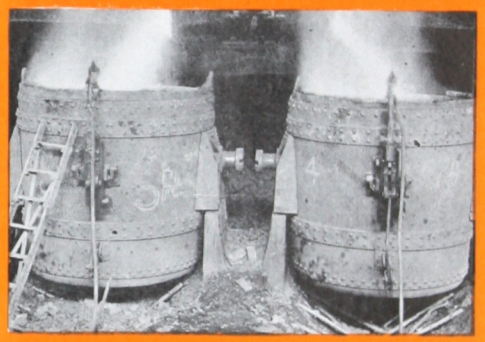


Fig. 38. Ladles in a Steel Casting Plant. Linings Laid With HYTEMPITE.

Fig. 39. Heat Treating Furnace (9-ft. wide x 32½-ft. long).

Fig. 40. Finishing Laying the Brick in the Top of an Ore Roaster. Application for HYTEMPITE.

Fig. 41. Patching Pit Furnaces With a Mixture of Crushed Old Fire Brick and HYTEMPITE.

NON-FERROUS FOUNDRIES

Many foundries of this type are among the oldest users of HYTEMPITE, which has proved its merits for this type of work over a period of more than 20 years:

CRUCIBLE FURNACES (Pit Type)

Use HYTEMPITE for bonding brick in brick-lined melting furnaces; it reduces erosion and increases life. Also for pointing and patching linings and repairing cracked and broken crucibles. For such work, the patch air-sets quickly and the furnace can be put in service without delay. A patch on a hot lining can be made with neat (undiluted) HYTEMPITE, and often saves a lining from rapid destruction.

NON-CRUCIBLE TYPE OF DIRECT ARC FURNACES

HYTEMPITE . . . for bonding the brick in roofs, sidewalls, and resistor piers in Bennett, Heroult, Snyder, Greaves-Etchell and similar furnaces. Also for patching and maintenance work. HYTEMPITE produces a virtually monolithic lining which gives the utmost of service with minimum repairs.

OPEN FLAME TYPE FURNACES

HYTEMPITE . . . unsurpassed for building monolithic linings in open flame type brass melting furnaces. Used as binder, for admixture with GANISAND or crushed fire brick. Resulting mixture molds very easily, air-sets with permanent structural strength, has high refractoriness, and withstands scouring action of flame.

BURNER NOZZLES

HYTEMPITE is excellent for cementing around burner nozzles.

LADLES

HYTEMPITE . . . mixed with GANISAND or crushed fire brick, for lining small ladles . . . also, for wash coating over same . . . also for patching spouts, etc.

INDIRECT ARC FURNACES (Non-Crucible Type)

Use HYTEMPITE for bonding and repairing fire brick and silica brick linings of Detroit, Booth, Re-Pel-Arc and similar types of furnaces.

ELECTRIC ANNEALING FURNACES

HYTEMPITE is recommended for bonding brick-work and patching.

Non-Ferrous Smelters and Refineries

(Copper, Lead and Zinc)

HYTEMPITE, Q-CHROME Cement and the QUIGLEY REFRACTORY GUN play an important part in the construction and maintenance of REVERBERATORY FURNACES in many copper smelting and refining plants.

HYTEMPITE is widely used for laying up silica brick in arch or roof—also for bonding and wash-coating of brickwork in flues. It resists the erosive action of hot ash-laden gases. Produces a strong arch which resists spalling and flame erosion much more effectively than where inferior bonding mortars are used, as failure of the arches almost always begins at the joints. (Q-CHROME is recommended for bonding silica and fire brick in front and side walls.) HYTEMPITE mixtures in conjunction with the QUIGLEY REFRACTORY GUN are invaluable for reverberatory furnace maintenance work. Repairs can often be made without a shutdown—while the furnace is hot.

COPPER REFINING FURNACES

HYTEMPITE is recommended for laying up silica brick in the arch of the furnace. Also for laying up all the brickwork in the combustion chamber walls and arches. (Q-CHROME is used for laying up the silica brick and magnesite brick in the side walls.)

ROASTERS

When used for bonding special hearth shapes, HYTEMPITE produces a hearth of great strength. Normally roasters are operated at low temperatures, insufficient to vitrify or sinter fire clay or heat-setting bonding mortars. HYTEMPITE forms a strong bond without heat—and retains its strength throughout the range of furnace temperatures. It is also recommended for bonding combustion chamber linings.

ZINC OXIDE FURNACES

For laying silica and fire clay brick in bridge walls, side walls and other parts of the furnace, HYTEMPITE is recommended.

WHAT SOME USERS SAY

Foundry Manager writes: "We have used HYTEMPITE with much success in lining cupolas. It is, without doubt, the best thing for patching we have ever used. HYTEMPITE stands the heat and gets harder than anything else and does not cut away as rapidly as fire brick or clay."

Superintendent says: "We use HYTEMPITE for bonding fire brick in our heating furnaces, and have standardized on this material."

Big Northern steel works uses HYTEMPITE for bonding stopper rod sleeve tile and laying fire brick "because nothing else stands this severe service."

Pennsylvania steel works says: "We formerly used fire clay for stopper rod tiles in bottom pour ladles, because it was cheap. But the cost for stopper rods was high, renewals were frequent, many failures occurred, and much metal was spilled. We adopted HYTEMPITE because it was more economical and reliable. There has not been a single failure, the HYTEMPITE lasts seven times as long as fire clay, and maintenance cost is low."

Fig. 42. Interior Reverberatory Furnace From Firing End.

Fig. 43. Gas Works—Long User of HYTEMPITE for Fire Brick Bonding and Patching.

Fig. 44. Gas Works—Pointing Up Cracks in Brickwork of a Hot Valve With HYTEMPITE.

Fig. 45. Gas Generator Arch—HYTEMPITE Used for Bonding the Brick.

GAS PLANTS *and* COKE OVENS

HYTEMPITE is successfully used in many large coke, water gas and producer gas plants for a variety of applications,—the principal ones being:

Boiler Settings
Gas Benches
Generator—Lining and Repairs
Carburetor—Lining and Repairs
Superheater—Lining and Repairs
Coke Ovens
Coke Oven Jamb Joints
Gas Producers
Retorts
Recuperators
Industrial Furnaces
Flue Linings
Crown Repairs
General Repairs

Where HYTEMPITE is used for bonding fire brick and silica brick in *water gas generators* it gives a thin, strong joint. HYTEMPITE-laid linings withstand the severe scouring action of water spray on the hot refractory, and stand up under abrasive and erosive action and shock in barring off the clinker.

HYTEMPITE prevents penetration of steam through the joints of brickwork to the steel generator shell and thus prevents corrosion. It is also invaluable for pointing up cracks, hot patches, and general maintenance. A wash coating of HYTEMPITE over the entire lining protects it from the scouring action of flame and hot blast.

Bond and surface brickwork in *coal gas benches, retort settings, arches, recuperators and flues,* with HYTEMPITE. It produces a solid, strong, air-and-gas-tight structure . . . preventing air leakage into waste gas flue where it would cause combustion. Withstands erosive action of blast and flame impingement.

Producer Linings laid up with HYTEMPITE are assured of gas-tight joints—the brickwork withstands barring.

Strong thin joints between bricks and blocks, joints that are air-and-gas-tight, are obtained. With HYTEMPITE, a bond is secured at room temperatures, which increases with heat, forming practically a one-piece lining. Hot gases, mechanical stresses and scouring will not affect such joints. The strong HYTEMPITE joints withstand impact of the bar and prevent loosening of the brickwork.

HYTEMPITE is also invaluable for patching producer linings.

IN BY-PRODUCT COKE PLANTS

HYTEMPITE is extensively used for

SEALING COKE OVEN JAMB JOINTS
and PATCHING DOOR LININGS

HYTEMPITE, used for bonding refractory mixtures, applied with the QUIGLEY REFRACTORY GUN, is the practice followed by many coke producers to seal coke oven jambs. HYTEMPITE mixtures adhere tenaciously to hot or cold surfaces.

For patching door linings HYTEMPITE is used in combination with CAST-REFRACT (a QUIGLEY PRODUCT). Eroded areas of coke oven doors are quickly restored, by application of a bonding coat of neat (undiluted) HYTEMPITE to the part to be patched—then building out to original thickness by troweling on CAST-REFRACT. This method has given splendid results in a number of coke plants. The savings are substantial.

EXPERIENCE RECORDS

Superintendent of a large New England gas works informs us: "We have used HYTEMPITE for the past 12 years for laying the silica brick walls of our retorts and have never known a failure. We find HYTEMPITE meets every requirement for a high-temperature cement, and we never need to worry about the results."

Florida gas plant superintendent says: "We have tried all kinds of high-temperature cements, but none equals HYTEMPITE."

Men at Eastern steel works (and by-product coke plant) patch coke oven jamb joints with HYTEMPITE by means of QUIGLEY REFRACTORY GUN. They have found "nothing equals HYTEMPITE and a GUN for patching jamb joints and making other coke oven repairs." At this great plant men in various departments fight for the QUIGLEY GUN to repair furnace bottoms. They use a special right-angle nozzle to shoot HYTEMPITE into furnace bottom cracks, even while the furnace is hot.

OIL REFINERIES

Petroleum refiners are large users of HYTEMPITE for a number of purposes; principally for laying up brick in side walls and arches of cracking stills; also for pointing up and repairing linings and for building monolithic baffles. QUIGLEY GAS/TITE Baffles (described on page 6) are in operation in great numbers of oil stills. They are easy to install at any angle, are extremely durable and gas-tight.

HYTEMPITE mixtures are applied with the QUIGLEY REFRACTORY GUN for protective surfacing of furnace walls, repairing baffles in stills and boilers; for building up eroded furnace walls and arches, and for general maintenance.

One of the recognized leaders in refinery design and construction has practically standardized on the use of HYTEMPITE for new construction of this type, and has used hundreds of tons of this product with eminently satisfactory results.

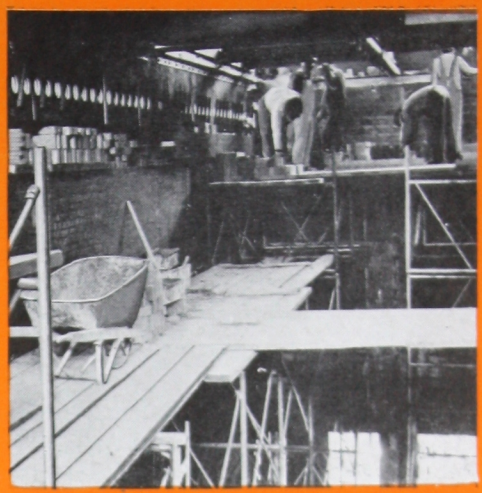


Fig. 46. Petroleum Refinery—Laying Fire Brick With HYTEMPITE in Cracking Plant Heaters. Over 30 Tons HYTEMPITE Used on This Job.

CERAMIC INDUSTRIES

(Including Lime, Cement and Gypsum Plants)

Increased life of linings in Rotary Cement and Lime Kilns is obtained with the use of HYTEMPITE for bonding brick kiln liners and brickwork in flues. Blocks are held securely in place. Resists vibration and reduces spalling.

HYTEMPITE mixtures are also invaluable for repairing spalled, burned out or fallen sections of kiln linings. These often occur, especially in the hot zone, and many plants have found that the application of HYTEMPITE mixtures with the QUIGLEY REFRACTORY GUN—made in practically no time —WITHOUT COOLING THE KILN—has saved them hundreds of dollars because it eliminates costly shut-downs. Repairs with HYTEMPITE fire brick mixtures and building up nose rings in the kilns in this manner are keeping maintenance costs down for many cement plants.

HYTEMPITE is widely used for laying brick in the burning zone of *vertical or shaft type lime kilns*. It produces a strong lining which resists vibration and abrasive action in charging. Also mixtures of HYTEMPITE and crushed fire brick are used for patching.

Many Gypsum Plants use HYTEMPITE for laying brick in combustion chamber walls, arches and flues; also for protective surfacing over linings, and for pointing up and patching brickwork.

Operators of *periodic kilns* use HYTEMPITE with excellent results for laying up brick in walls and roof; also in floor checkers and flues. HYTEMPITE, used for this purpose, prevents disintegration of brickwork at joints, and produces a strong, virtually monolithic structure of the entire lining. It is also ideal for pointing up and repairing cracks and holes, and for wash-coating the lining. HYTEMPITE-crushed fire brick mixtures are applied quickly and economically for protective surfacing of linings and for building up eroded spots.

Many potteries find HYTEMPITE a necessary maintenance material. They use it for bonding and surfacing refractories in *Enameling and Frit* Furnaces. Also for hot or cold patching.

Fig. 47. Kilns Laid Up With HYTEMPITE and Fire Brick.

Fig. 48. Portland Cement Rotary Kilns—HYTEMPITE Used to Lay Blocks and for Patching Nose Rings.

GLASS PLANTS

Glass Plants find HYTEMPITE the ideal material for laying up and grouting brick in tanks—for caps and fire clay and silica brickwork above the tanks. (HYTEMPITE is not recommended in contact with glass.) It is also widely used for bonding brick in regenerator checker chambers, jambs, arches, oven doors and ports and flue linings; for wash coating silica brick in roofs and flues; for hot patching and general maintenance in these plants.

HYTEMPITE protects the brickwork from soaking heat, and penetration of alkaline fumes from the fluxes used in glass making. As a maintenance material it greatly prolongs the life of the linings. Here is a typical report covering the performance of HYTEMPITE at a prominent glass plant:

"The average life of a glass melting tank in this plant is fourteen to sixteen months. By the use of HYTEMPITE, mixed with crushed brick or silica, and neat HYTEMPITE for hot patching, life of tanks has been increased to TWENTY NINE months. In addition, lehrs and other furnaces are regularly maintained with HYTEMPITE."

Entire brick linings of *Pot Furnaces* are laid with HYTEMPITE—walls, crown, checkers, flues, ports. Also for wash-coating of walls, ports and flues. HYTEMPITE produces a strong air-and-gas-tight lining, resistant to spalling due to sudden temperature drop when pots are removed.

In *Lehrs* HYTEMPITE is used for laying up brick in walls, roof, and combustion chamber arches. Also for wash coating of brickwork and for patching and general maintenance. It insures an air-tight and gas-tight muffle.

Tuyeres which have become cracked or broken can be hot patched with neat (undiluted) HYTEMPITE if the fracture is not too large.

MISCELLANEOUS FURNACES

In addition to the many applications for HYTEMPITE as outlined in the foregoing pages under specific industries, it is also widely used with utmost satisfaction for the following:

MUNICIPAL INCINERATORS

A large number of municipal incinerators are built with HYTEMPITE as a bond for the refractories. Longer life and reduced maintenance are secured through its use. It protects the brickwork from soaking heat in the roof, and reduces spalling due to varying temperatures.

HYTEMPITE is used in these incinerators for laying up brickwork in walls and crowns of furnaces; also for walls and arches of fire boxes.

VARNISH KETTLES

HYTEMPITE is used for bonding, surfacing and repairing combustion chamber walls and arches under varnish kettles. It improves refractory performance by protecting brickwork from soaking heat and erosive action of flame and gases.

BAKE OVENS

HYTEMPITE forms a strong air-set bond when used for laying brick in brick-lined ovens.

DOMESTIC OIL BURNER INSTALLATIONS

HYTEMPITE, used to bond the brick and shapes in oil burner combustion chambers, insures long life and freedom from maintenance and servicing expense.

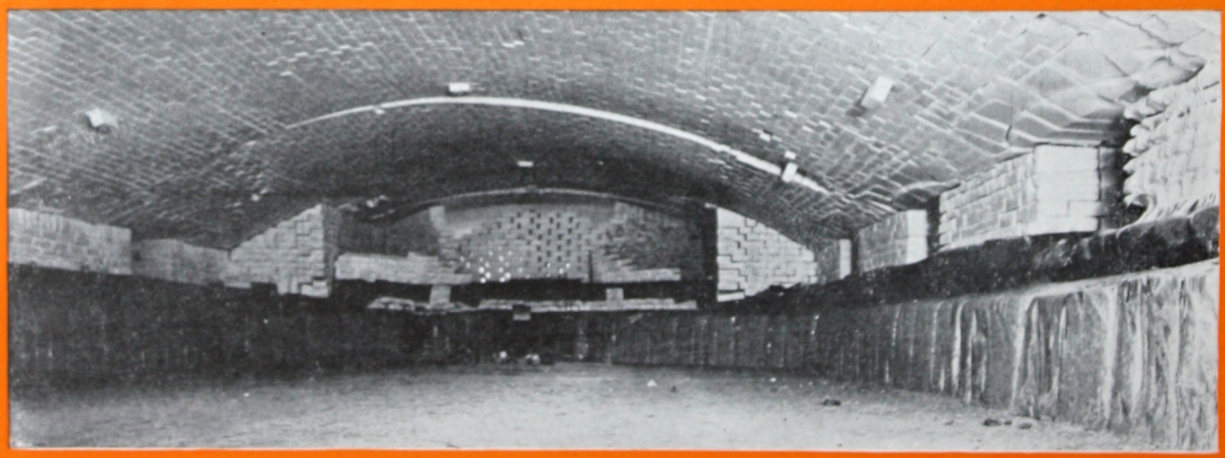


Fig. 49. Glass Tank Laid With HYTEMPITE.

Fig. 50. Q-CHROME is Used to Bond and Surface-coat Refractories in Metallurgical and Boiler Furnaces Subject to Extreme Conditions of Service.

Fig. 51. Oil-Fired Marine Boiler, (1) Brick Laid With Q-CHROME; (2) Brickwork "Primed" With Thin Brush Coat of Q-CHROMASTIC; (3) Heavier Broom Coat of Q-CHROMASTIC.

Q-CHROME

(REG. U.S. PAT. OFF.)

NEUTRAL BASE REFRACTORY CEMENT

Q-CHROME is a neutral chrome-base refractory cement. It is used for laying fire brick, chrome, magnesite, and other refractory brick and tile, in metallurgical and boiler furnaces where extreme temperatures and destructive slagging, chemical and abrasive actions are encountered.

Q-CHROME is widely used in the steel and non-ferrous metallurgical industries because of its neutral refractory characteristics, and resistance to high temperatures, slagging and abrasive conditions.

In boiler furnaces burning hog fuel, bagasse, high sulphur coal or oil, refinery acid sludge, low grade asphaltic oils, etc., Q-CHROME provides a highly refractory and durable bond, which resists erosion and penetration of flame, gases and slag into the joints.

These same advantages make Q-CHROME highly suitable for use in other types of oil, stoker, and powdered-coal-fired furnaces operated at high ratings.

Q-CHROME is made of high-grade selected Rhodesian Chromite containing a minimum of silica. It is especially processed to develop maximum plasticity and bonding strength. It is practically free from shrinkage, very resistant to abrasion and withstands fluctuating temperatures.

An outstanding quality of Q-CHROME is its resistance to chemically active slags, particularly those of a basic nature. It prevents penetration of slag and molten metal. It resists erosion due to corrosive gases and fluxes. Q-CHROME does not flux the adjoining refractories, and serves as a neutral separating material to prevent reaction between refractories of different chemical composition. It is virtually non-reactive, even at very high temperatures, and can be used to lay chrome, magnesite, and other special bricks. Details in Bulletin No. 322.

Q-CHROMASTIC

(REG. U.S. PAT. OFF.)

PLASTIC SUPER-REFRACTORY SURFACING MORTAR

Q-CHROMASTIC is applied with a broom or QUIGLEY REFRACTORY GUN on new or old furnace brickwork. It adheres tenaciously to wall surfaces . . . prevents flame penetration and minimizes slag adhesion . . . prevents fluxing and reduces injury to brickwork in removing clinker . . . resists abrasion and flame erosion — and prolongs the life of furnace brickwork by "taking the brunt of service."

Premature failure of refractory structures is not necessarily due to the temperatures encountered in the furnace, but to the effect of impurities in the fuel—such as sulphur, alkalies, iron, etc. These together are the basis of slags formed in combustion. They react with and flux the lining, lowering the fusion point—with consequent rapid erosion and destruction.

Q-CHROMASTIC prevents this, because it acts as a neutral barrier between the brick, and the flame and gases, taking the brunt of service.

Experience has shown that most oil slags do not adhere appreciably, if at all, to Q-CHROMASTIC, due to its chemical inertness, high refractoriness, and hard dense surface which prevent slag penetration.

This has been proved repeatedly in boiler and other types of furnaces burning low grades of oil or by-product fuels, and operated at high ratings.

One of the most convincing demonstrations of Q-CHROMASTIC protection is to apply a brush coat of it on half a wall—the other half to remain uncoated as a check. The results are frequently startling — the more so when slagging conditions are severe.

Q-CHROMASTIC protects the brickwork from the fluxing action of incandescent or molten ash. This action is particularly severe where low-grade coals are used. It is also a serious factor in powdered coal-fired furnaces. Details in Bulletin No. 315.

Fig. 52. Walls, Ducts, Casings, Drums of Large Boilers Insulated With INSULAG.

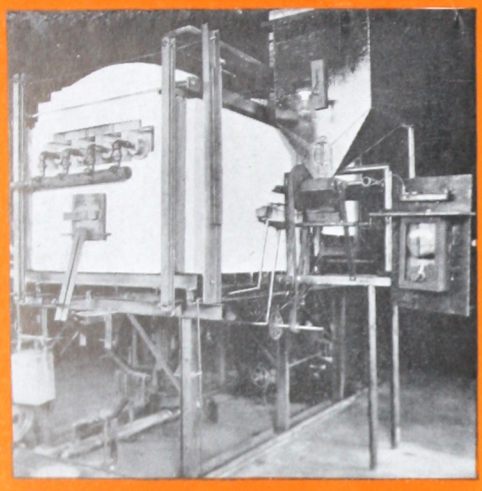


Fig. 53. Powdered (Sponge) Iron Furnace Insulated on Roof and Sides by INSULAG.

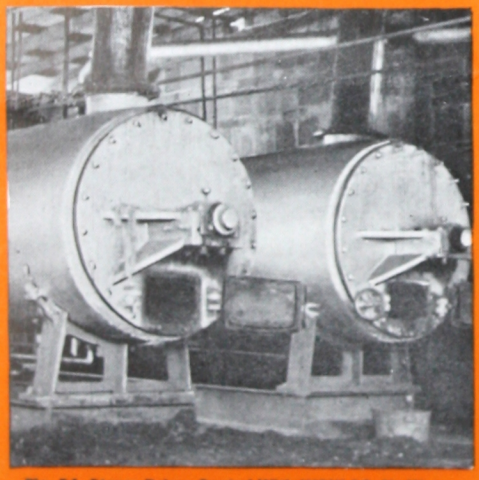


Fig. 54. Steam Driers Coated With INSULAG. No Wrapping or Painting Necessary.

INSULAG

(REG. U. S. PAT. OFF.)

INSULAG is a superior plastic refractory lagging and finishing insulating material for high temperature equipment up to 2200°F. It is also used to fire-proof bins, walls, columns, roof structures, etc. INSULAG does not shrink, expands as it dries, sets quickly and bonds firmly to hot or cold surfaces. Has high crushing strength and does not bruise or break in ordinary service. Does not dissolve or collapse from contact with water. It is quickly and easily applied by molding, troweling or QUIGLEY REFRACTORY GUN wherever plastic insulation is required. Fully described in Bulletin 327.

USES OF INSULAG

PETROLEUM INDUSTRY — Refineries and Natural Gasoline plants use INSULAG on towers, tanks, stills, boilers, breechings, pipe lines and for fire proofing supporting steelwork, panel construction of still furnaces, baffle plates and door linings.

METALLURGICAL FURNACES—INSULAG is used for insulating heat treating, forging, annealing, recuperators, reverberatory, and open hearth furnaces; for hot blast stoves, bustle pipes, hot blast mains, pipes and other heated equipment where insulation is required.

CERAMIC PLANTS—INSULAG is used on kilns, glass lehrs, glass tanks, hot air pipes, underground flues, recuperators and checker chambers.

Plants manufacturing pottery, glass, brick, etc., find it most adaptable.

POWER PLANTS—INSULAG meets the engineer's demand for a suitable material for covering turbines, feed water heaters, hot liquid storage tanks, drums, smoke flues, pipes and flanges. It is also recommended as insulation in back of refractory tile of water wall boilers and outside fire brick walls in boiler furnace construction.

GENERAL USES—INSULAG has such a wide range of uses that it is indispensable as a plastic lagging in plants using fuel fired furnaces. It is "the lagging material of a thousand uses."

FIRE-PROOFING—Bins, walls, roof structures, furnace rooms, columns, etc., may be protected against fire by applying INSULAG as a veneer coating. The fire retardant properties of INSULAG render it ideal for this purpose.

WEATHER-PROOFING—Where reenforced INSULAG applications are constantly exposed to weather it is advisable to use galvanized material for reenforcing.

While INSULAG is not injured by contact with the weather, yet to retain maximum insulating efficiency at all times it is often desirable to waterproof INSULAG with TRIPLE-A Protective Coatings.

THE QUIGLEY REFRACTORY GUN

(PATENTED)

Scientific Mechanical Application of Refractories in Plastic Form

For quick furnace repairs, hot patching, protective surfacing, and baffle maintenance.

With the QUIGLEY REFRACTORY GUN a whole battery of furnaces can be repaired in the time formerly required to repair one. The GUN will quickly and efficiently fill cracks or holes, restore burned-out walls, surface new walls, or resurface old ones, and repair leaky baffles.

An exclusive advantage of the QUIGLEY REFRACTORY GUN is that it handles premixed, properly seasoned refractory mixtures—of the proper consistency for the job. It shoots light or heavy mixtures as the job requires, with high velocity to any place in the walls and arches of furnaces. Because of the force of application, the mixture will stick to hot or cold surfaces where trowelled applications fail to hold.

With the QUIGLEY REFRACTORY GUN and suitable mixtures of HYTEMPITE and refractory aggregate, A-R MIX or Q-CHROMASTIC, slightly eroded furnace walls and arches can be restored to original condition . . . often saving a rebuilding job.

Repairs can be made while the furnace is hot, and otherwise inaccessible places reached by the use of long extension nozzles, thereby saving the cost of a shutdown. The QUIGLEY REFRACTORY GUN often repays its cost in savings on a single job.

The QUIGLEY REFRACTORY GUN is also used to apply INSULAG or other plastic insulation to exterior surfaces, to apply Q-CHROME Cement to Open Hearth back walls and arches, etc. Can also be used to apply Portland Cement, whitewash, etc.

The QUIGLEY REFRACTORY GUN has a capacity of 2 cu. ft. of mixed refractory material. This charge will cover 100 sq. ft. with a coat ¼ inch thick. The GUN is operated by compressed air, 70 to 90 lbs. pressure. Piston action, forced feed.

Send for Bulletin 310

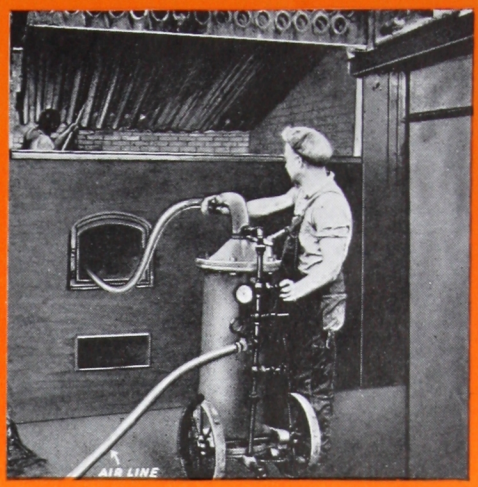


Fig. 55. Repairing Leaky Baffle With the QUIGLEY REFRACTORY GUN. The Nozzle Slides Up Between the Tubes and Applies the Plastic Mixture of HYTEMPITE and Refractory Material at Any Desired Point.

Fig. 56. The QUIGLEY REFRACTORY GUN in Action. Resurfacing an Eroded Wall With HYTEMPITE Mixture.

QUIGLEY TRIPLE-A PROTECTIVE COATINGS

TRIPLE-A PROTECTIVE COATINGS afford lasting protection from corrosion due to steam, moisture, acids, alkalies, heat, fumes of ammonia, chlorine, sulphur dioxide and other destructive agents.

They penetrate pits and pores; form a tough, durable protective film, resist abrasion and heat; dry by evaporation, not oxidation; do not become porous or brittle. Made in Black, White, Colors and Aluminum.

TRIPLE-A No. 10 Plastic is used for sealing exterior of boiler walls to prevent air-infiltration; for roof and tank repairs, and weather-proofing heat insulation exposed to the elements. Applied like plaster coating.

Nos. 10, 20 and 44 *can be applied to damp surfaces.* Send for bulletins.

Fig. 57. Gas Works—Hortonspheres, Gas Holder, Filter Tanks, Stacks, Pipes, Fencing Protected By TRIPLE-A.

OTHER QUIGLEY PRODUCTS

QUIGLEY SPECIFICATION FIRE BRICK—made in many different brands and types, varying in chemical and physical characteristics to meet the refractory requirements of practically every type of furnace. All standard shapes carried in stock and unexcelled facilities for making special shapes.

FYRE-MORTAR—is a dry refractory bonding mortar. It is a superior material for use wherever a dry cement is desired—for bonding fire brick; for plaster coatings; for pointing up cracks and reclaiming eroded furnace walls, and other similar applications.

MONO-LINE—first quality plastic fire brick in easy-working ready-to-use form. Highly refractory, practically neutral as to expansion and contraction, and lasts longer in actual service. For monolithic (jointless) furnace linings, and for the more substantial furnace repair jobs.

HEARTH-CRETE—a special patented chrome-base castable refractory of outstanding merit for building monolithic hearths or bottoms in forging and other steel heating furnaces; for monolithic sidewalls in copper refining furnaces; for making burner blocks subject to severe conditions and for many other purposes.

CAST-REFRACT—refractory concrete—can be cast or molded into any desired form—sets quickly with great structural strength. For making special shapes, burner blocks, furnace door linings, etc. Temperature limit 2600° F.

ACID PROOF CEMENTS—plastic, ready-mixed acid and heat resisting cements for bonding and repairing acid resisting masonry structures. Recognized throughout the chemical industries as the standard materials of their kinds.

INSULBRIX are light weight, porous, cellular, low heat storage insulating fire brick for direct or indirect exposure to flame and furnace gases in boiler and other furnaces, ovens, and kilns. They combine the advantages of a high refractory and an efficient heat insulator of low heat storage capacity . . . two in one. Recommended to replace furnace structures formerly built of heavy refractories and backed up by insulating brick. Heat radiating against INSULBRIX walls is reflected back into the furnace for useful work, instead of being absorbed, or entering thick walls to be wasted either in radiation to the outer surface or in heat storage.

ADVANTAGES: Reduce B.t.u. radiation losses from the outer walls, reduce time and fuel necessary to heat up furnaces, reduce heat storage losses, reduce labor costs, improve furnace room conditions, improve temperature control, improve heat distribution, increase furnace output.

INSULBRIX 2600; service temp. up to 2600° F. Developed for heat-treating, annealing, and other types of fuel fired and electrically heated furnaces; as well as waste heat boilers, flues; also oil stills, core ovens, baking ovens; etc.—1/17 heat storage capacity of heavy refractories for same heat flow; 1" has insulating value of 5" of fire brick.

INSULBRIX 3000; service temp. up to 2850° F. Developed for high temperature furnace work—lining heating furnaces, soaking pit linings and covers, boiler settings, annealing furnaces, and controlled forging furnaces, etc.—1/14 heat storage capacity of heavy refractories for same heat flow; 1" has insulating value of 4½" of fire brick.

INSULBRIX 3000 SUPER; service temp. up to 3000° F.; for forging and other applications where a super-brick is required. 1/10 heat storage capacity of heavy refractories for same heat flow; 1" has insulating value of 2¾" of fire brick.

INSULBLOX are light weight low heat storage refractory block insulation—for reducing heat storage and radiation losses at operating temperatures up to 2200° F. Their use results in increased furnace production at lower costs . . . INSULBLOX are used directly exposed to furnace atmosphere up to 2000° F. and up to 2200° F. in back of fire brick walls, roofs and arches in open hearth, forging, heat treating, melting, and other types of industrial furnaces.

They are ideal for insulating boiler settings, regenerator chambers, hot blast stoves, oil stills, fractionating towers, high temperature ducts, furnace shields and flues; also on vertical and horizontal boiler shells.

INSULCRETE is a light weight cellular insulating refractory concrete for furnace linings, door linings, heat shields, shapes, covers, and kindred uses; recommended for temperatures up to 2500° F. No cutting, fitting or ramming — *just pour into place.* 1" of INSULCRETE equals about 4" of fire brick in insulating value and has about one-seventh the heat storage capacity of fire brick walls of equal heat flow.

INSULINE is available in Ground form for use as insulating fill and as Sized Aggregate for use with Portland cement or other suitable binders to make an insulating concrete.

Q-SEAL—plastic expansive joint sealing compound for threaded, flange, gasket and metal-to-metal joints. High-pressure steam, oil, gasoline and solvents. "The pigment expands."

DAMIT—waterproof joint-sealing compound. Makes and keeps joints tight in water, air, gas, and low pressure steam lines.

ANNITE—detergent materials for every industrial cleaning need.

Bulletins on Request

For further information write **QUIGLEY COMPANY INC.** *56 West 45th Street*

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